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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/237,125	01/26/1999	MUNIRATHNA PADMANABAN	1997/A006	9591

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EXAMINER

ASHTON, ROSEMARY E

ART UNIT	PAPER NUMBER
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1752

DATE MAILED: 07/25/2002

14

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application N .

09/237,125

Applicant(s)

PADMANABAN ET AL.

Examiner

Rosemary E. Ashton

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 April 2002.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12, 14-26, 28 and 30-37 is/are pending in the application.
- 4a) Of the above claim(s) 10, 15 and 21 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 22-26, 28 is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-9, 14, 16-20, 22 and 30-37 is/are rejected.
- 7) ☒ Claim(s) 6, 11, 12 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- ☐ Interview Summary (PTO-413) Paper No(s). _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other:

DETAILED ACTION

1. The examiner adds the following comments directed to the instant application:

A. With respect to applicant's comments directed to combining claims 4, 10, 20 and 31 with the elected claims the examiner finds the arguments persuasive with respect to claims 4, 20 and 31. Claim 10 reads on Z being ND and ND was not the elected species (applicant elected O) and thus it is not examined.

B. With respect to applicant's comments directed to claim 32 it is unclear why claims 15 and 21 should be examined as they are directed to a non-elected invention because they have different polymers than the polymers of the elected group. On page 16 of the specification it states the polymers having blocked isocyanate groups are those defined by formula V. The polymer defined by formula V is claimed in claims 15 and 21. Dependent claim 16 recites the amount of monomers for the isocyanate, thioisocyanate and blocked derivatives, however, no blocked derivatives have been examined and they will not be examined because they are directed to a non-elected group, namely a composition having a polymer defined by Formula V.

C. With respect to the examination process using an election of species. Due to the numerous polymers claimed an election of species was required for initial examination of the invention. Applicant elected $R1 = CH_2CH_2$; $X=O$; $Y=O$, NR_4 ; $Z=O$; $R2 = CO_2CH_3$; $D = CH_2$ -anthracene. In the prior office action the examiner found art reading on the elected species which applicant overcame by amending the claims in the amendment of April 5, 2002.

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As required the examiner expanded the search to include other species. The species examined by the examiner for this second and final office action are: $R1 = CH_2CH_2$ for monomer m; $R1$ for monomer o is as recited in claim 1; $X=O$; $Y=O$, NR_4 ; $Z=O$; R_2 is any of the groups in claim 1; R_3 as recited in claim 1; D as recited in claim 1. Prior art was found applicable to radiation sensitive compositions and polymers.

D. With respect to allowable subject matter of the elected species:

With respect to the polymer claims 17-20: allowed polymers for the original elected species (having the monomers defined as m,n,o,p,q) are: n and o > 0; n and p > 0 (by definition the polymer must also have m and/or o); m and p > 0; m and o > 0; m, n and o > 0. The elected species are $R1 = CH_2CH_2$; $X=O$; $Y=O$; NR_4 , $R_4=H$, Ak, Ar, $Z=O$; $R_2=CO_2CH_3$; $D=CH_2$ -anthracene. A terpolymer having only m, q and n [isocyanatoethyl (me)acrylate/maleic anhydride/methyl(me)acrylate] as defined by the elected species is also allowable and meets the limitations of m and q > 0, however, prior art was found for m and q > 0 with monomer n wherein the polymer is a penta polymer having 3 monomer units (methyl methacrylate, butyl methacrylate and styrene) meeting the limitations of monomer n in claim 1 (see Wamprecht et al below).

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1,3,8,14,17,19,20,33,34,36,37 are rejected under 35 U.S.C. 102(b) as being anticipated by Ishizuka et al U.S. patent no. 5,731,127.

The patent teaches a photosensitive composition comprising a polymer having monomer units of m, n and o as claimed by applicant (formulation of compound 11, col. 19). The polymer is shown in the Chemical Abstract AN 1996:753778 having RN 184348-66-1. It is the examiner's position, absent evidence to the contrary, the polymer inherently has monomers m, n and o that "lie together between 5 and 50,000" because the polymerization time and temperature are sufficient to form a polymer having monomers m, n and o of at least 5. This statement is supported by the definition of polymer in the Polymer Science Dictionary which states "the term polymer being reserved for molecules with many, usually above 10 or 20, repeat units" (page 424).

The composition also comprises a novolac resin which has hydroxyl groups as in claim 14 (col. 9, lines 20-30).

5. Claims 4,9,16,30,32 are rejected under 35 U.S.C. 103 as being obvious over Ishizuka et al U.S. patent no. 5,731,127 cited above.

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With respect to claim 4 Ishizuka exemplifies a hydroxy-phenyl group as the urea monomer as shown in formula IIa in col. 9 and a hydroxyl group is not one of the phenyl substituents in claims 4 and 30. However, Ishizuka also teaches the urea monomer is represented by formula IIb which is a -COOH substituted phenyl group as claimed. Thus, it would have been obvious to one of ordinary skill in the art to use the polymer formed in compound 11 having a -COOH group rather than an -OH group on the phenyl ring with a reasonable expectation of obtaining a polymer for a photosensitive composition because Ishizuka teaches the -COOH phenyl group monomer having formula IIb may be used in the invention to provide a photosensitive composition for making a planographic printing plate (col. 9, lines 20-30).

With respect to claims 9,16,30,32 the examiner notes the prior art teaches the claimed polymer but it does not teach the monomer mol fraction or monomer proportion as in these claims. However, it would have been obvious to one of ordinary skill in the art to vary the amount of monomer units in the polymer through routine experimentation so as to obtain a photosensitive composition because optimization of reagent amounts is well known in the art. The amount of monomer in the polymer is considered a results-effective variable as stated in col. 2, lines 54-64 where the patent teaches the monomer having a urea group and a phenolic group improves image development.

As stated in section 2144.05(b) of the MPEP:

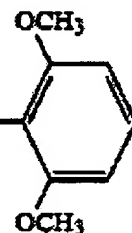
"Generally, differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller , 220 F.2d 454, 105 USPQ 233, 235 (CCPA 1955).

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6. Claims 1,2,4,7,8,14,17,18,20,32,33,35,37 are rejected under 35 U.S.C. 102(b) as being anticipated by Kato et al U.S. patent no. 4,971,871.

The patent teaches a photosensitive composition comprising a polymer having monomer units of n and o as claimed by applicant as shown below for polymer A-35 (col.47).

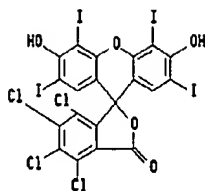
TABLE 5-continued

TABLE 5-continued			
		$\begin{array}{c} \text{CH}_3 \\ \\ \leftarrow \text{CH}_2 - \text{C} \right)_{7.9} - \left(\text{X} \right)_{2.0} - \left(\text{CH}_2 - \text{CH} \right)_{1.0} \\ \qquad \qquad \\ \text{COOC}_4\text{H}_9 \qquad \text{COOH} \end{array}$ <p>(Copolymerization Ratio: % by weight)</p>	
Example No.	Resin (A)	X in Formula Above	Mw
35	A-35	$\begin{array}{c} \text{CH}_3 \\ \\ \leftarrow \text{CH}_2 - \text{C} \right) \\ \\ \text{COO}(\text{CH}_2)_3\text{NHCOOCH}_2 - \text{C}_6\text{H}_3(\text{OCH}_3)_2 \end{array}$ 	27,000

Both butylmethacrylate and acrylic acid meet the limitation of monomer in claim 8 and the benzyl group has alkoxy substitution as in claims 4, 20 and 37. The mole fraction of monomer n is 0.8 as in claims 7 and 30.

The polymer is used in the photosensitive composition comprising Rose Bengale (example 24, col. 42). Rose Bengale is a compound having hydroxyl groups as shown below and thus meets the limitations of claim 14.

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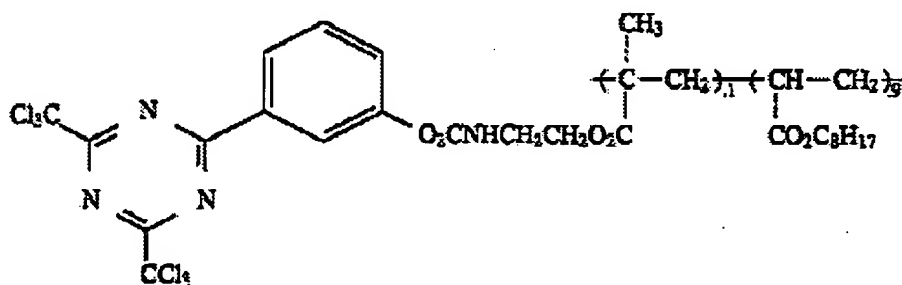
●2 Ha

7. Claim 30 is rejected under 35 U.S.C. 103 as being obvious over Kato cited above.

With respect to claim 30 Kato exemplifies a dimethoxy benzyl group in polymer A-35, however, it would have been obvious to one of ordinary skill in the art to use an unsubstituted benzyl group ($\text{CH}_2\text{-Ph}$) in polymer A-35 with a reasonable expectation of obtaining a polymer for a photosensitive composition because in col. 18, lines 22-52 Kato teaches the monomer having formula XII in col. 17 is defined by formula XV in col. 18 wherein Y^c is a 2,6-dimethoxyphenyl as shown in polymer A-35 or an unsubstituted phenyl (Ph).

8. Claims 1,2,4,7,14,17,18,20,32,33,34,35,37 are rejected under 35 U.S.C. 102(b) as being anticipated by Bonham et al U.S. patent no. 5,496,504.

The patent teaches a photosensitive composition comprising a polymer having monomer units of n and o as claimed by applicant as shown below for the polymer in example 23 (col. 24).



The mole fraction of monomer n is 0.9 as in claims 7 and 30. It is the examiner's position, absent evidence to the contrary, the polymer inherently has monomers n and o that "lie together between 5 and 50,000" because the polymerization time and temperature are sufficient to form a polymer having monomers n and o of at least 5. This statement is supported by the definition of polymer in the Polymer Science Dictionary which states "the term polymer being reserved for molecules with many, usually above 10 or 20, repeat units" (page 424).

The phenyl ring is substituted with an aromatic triazine group meeting the "aryl" limitation of claims 4,20 and 37.

The photosensitive composition has triethylamine as in claim 14 (example 24 in col. 25).

9. Claims 17,18 are rejected under 35 U.S.C. 102(b) as being anticipated by Wamprecht et al U.S. patent no. 4,990,583.

The patent teaches a polymer A1 in Table 1, col. 8, having monomer units of m, n and q as claimed by applicant. The polymer comprises butyl acrylate, styrene, methyl methacrylate (all monomer n), maleic anhydride (monomer q) and isocyanatoethyl methacrylate (monomer m) and is shown in CA 1990:141429.

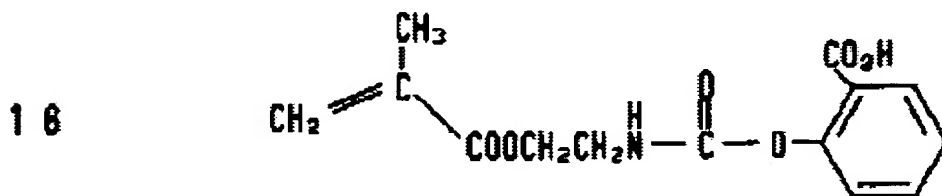
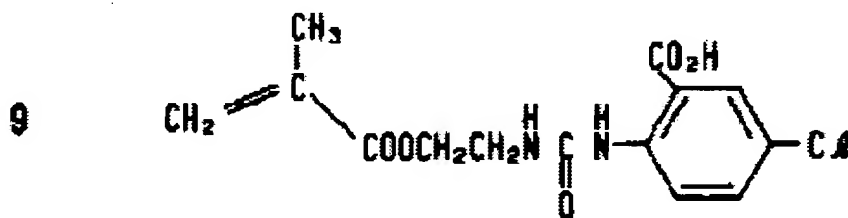
10. Claims 1,3,5 are rejected under 35 U.S.C. 102(b) as being anticipated by Schwalm et al SPIE, 1988 article.

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Schwalm teaches a photosensitive composition for a resist composition comprising a homopolymer containing pyridinium-ylide having monomer o wherein D is pyridine, R1 is CH_2CH_2 , $\text{Y}=\text{NH}$ (Table 1, page 25, polymer III).

11. Claims 1,2,3,5,30 are rejected under 35 U.S.C. 102(b) as being anticipated by Kawamura et al JP 07-36185.

Kawamura teaches a photosensitive composition comprising a homopolymers of monomers o shown below for monomer 9 on page 6 and monomer 16 on page 8.



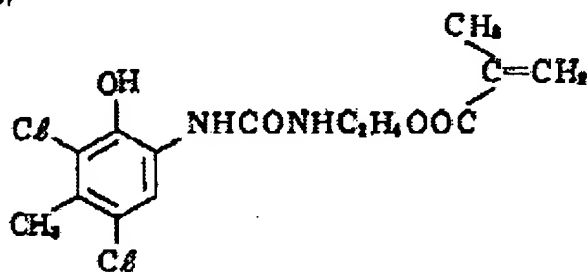
12. Claims 1,8,17,19,33,34,36 are rejected under 35 U.S.C. 102(b) as being anticipated by Matsunaga et al JP 61-035444.

Matsunaga teaches a photosensitive composition comprising polymers of monomer o and n as shown in CA 1986:562153 which are the polymers in examples 5 and 21, Table 2 on

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page 291 of the patent wherein "3" in the Table is compound (3) on page 284 meeting the limitation of monomer 0 (shown below). Monomers n is methyl acrylate as in claim 8 and acrylic acid (example 21) or methacrylic acid (example 5).

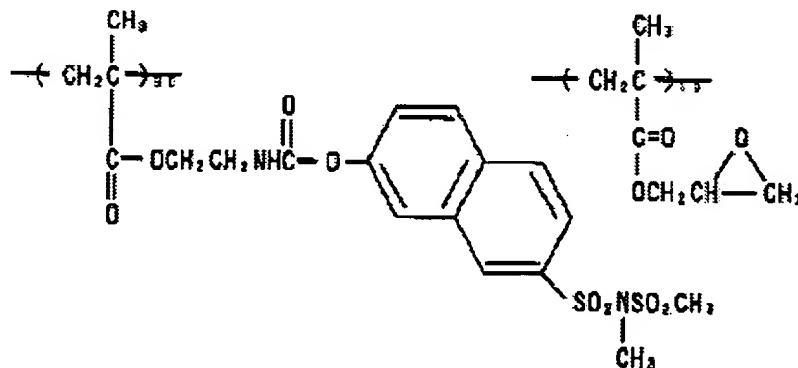
(3)



13. Claims 1,2,4,7,17,18,20,32,33,34,35,37 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 07-028242 to Kawamura.

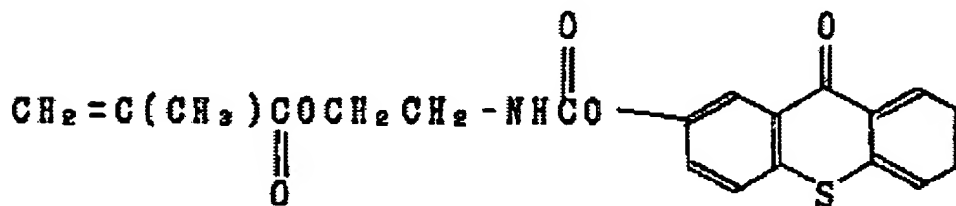
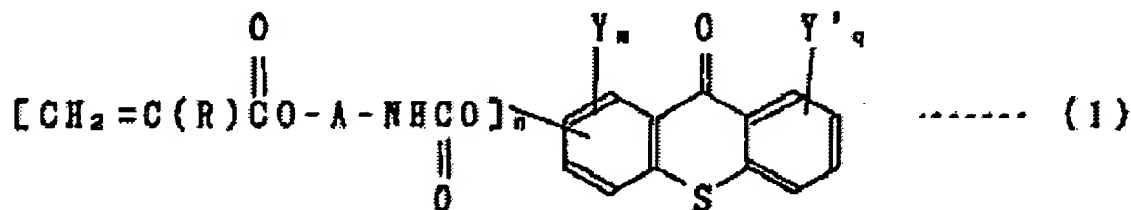
The patent teaches a photosensitive composition comprising a polymer having monomer units of n and o as claimed by applicant as shown below for polymer S-11 in col. 49 having a mole fraction of n= 0.10. Monomer unit n is a substituted alkyl group. As shown below the polymer has at least 5 units of n and o.

S - 11



14. Claims 1,2,5,17,18,32 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 04-026687 to Ohayashi et al.

The patent teaches a photosensitive composition comprising a homopolymer having monomer unit o as claimed by applicant as shown below for the polymer having formula (1) on page 618 and the exemplified polymer on page 620. The homopolymer has at least 5 monomer units.



Allowable Subject Matter

15. Claims 22-26, 28 are allowed, however, before allowance claims 22-26 and 28 must have the polymers recited in claims 22-26 and 28.

The following is a statement of reasons for the indication of allowable subject matter: No prior art was found that discloses the method of claim 22 or using the composition on a semiconductor substrate.

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16. Claims 6,11,12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

For the species: R1 in monomer m is CH_2CH_2 , X is O; Y is O or NR_4 ; Z is O; R2 is as recited in claim 1; R3 is as recited claim 1; R1 in monomer o is as recited in claim 1; D is as recited in claim 1.

No prior art was found for an antireflective or radiation absorbing composition having a polymer with the monomer units m and o (claim 6); m and p (claim 11); and m, n, o and p (claim 12) for the species recited directly above.

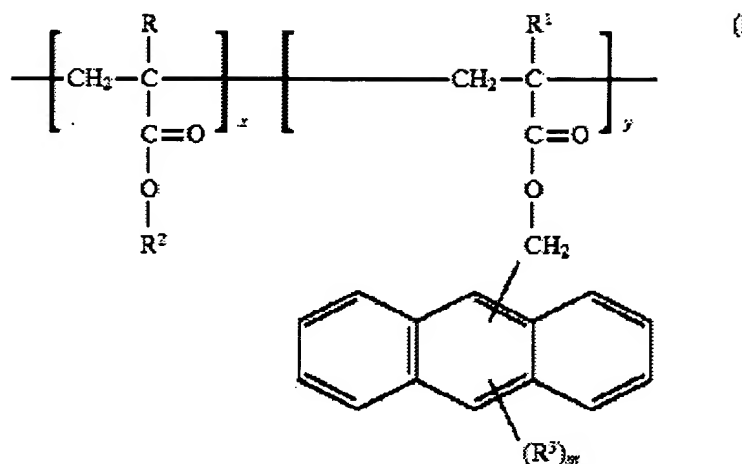
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Repeated from paragraph 1-D above: With respect to allowable subject matter of the polymer claims 17-20: allowed polymers for the original elected species (having the monomers defined as m,n,o,p,q) are: n and o > 0; n and p > 0 (by definition the polymer must also have m and/or o); m and p > 0; m and o > 0; m, n and o > 0. The elected species is R1= CH₂CH₂; X=O; Y=O; NR₄, R₄=H, Ak, Ar; Z=O; R₂=CO₂CH₃; D=CH₂-Anthracene. Thus, any polymer in claim 17 having monomer p or o is allowable because it has a unit of CH₂-Anthracene. A terpolymer having only m, q and n [isocyanatoethyl (me)acrylate/maleic anhydride/methyl(me)acrylate], or a di-polymer having (isocyanatoethyl (me)acrylate/maleic anhydride) as defined by the elected species, is also allowable and meets the limitations of m and q > 0, however, prior art was found for m and q > 0 with monomer n wherein the polymer is a penta polymer having 3 monomer units (methyl methacrylate, butyl methacrylate and styrene) meeting the limitations of monomer n in claim 1.

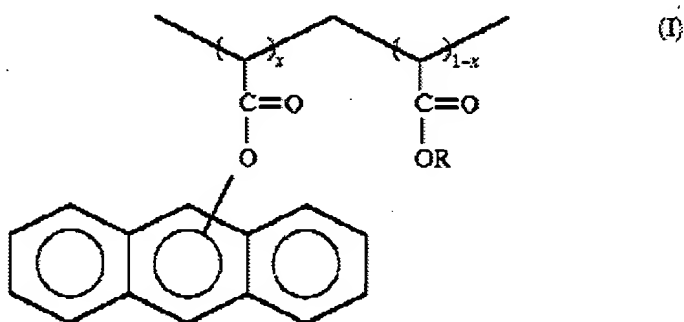
Conclusion

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Sinta et al U.S. patent no. 5,886,102 teaches an ARC comprising a polymer meeting the limitations of monomers p and n. As shown in col. 5 the polymer having formula I below has D = CH₂-Anthracene and R₂ is an alkyl group. Other D chromophores are polycyclic and heterocyclic rings such as acridine, quinoline, phenanthryl and hydroxyquinoliny (col. 4, lines 45-67). The polymers do not meet the limitations of the instant application because they do not have a monomer unit m or o as recited in the claims of the instant application.

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Thackeray et al U.S. patent no. 5,851,730 teaches an ARC comprising a polymer meeting the limitations of monomers p and n. As shown in col. 6 the polymer having formula I below has D = Anthracene and R₂ is H or an alkyl group.). The polymer does not meet the limitations of the instant application because it does not have a monomer unit m or o as recited in the claims of the instant application.



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18. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rosemary E. Ashton whose telephone number is 308-2057. The examiner works a flexible work schedule and can normally be reached M-F between 10:00 am and 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Janet Baxter can be reached on 308-2303. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 308-0661.



Rosemary E. Ashton
Primary Examiner
Art Unit 1752

rea
July 23, 2002

ROSEMARY ASHTON
PRIMARY EXAMINER